

Virginia Department of Health
Smallpox: Overview for Healthcare Providers

Organism	Variola virus (an <i>Orthopoxvirus</i>)
Infective Dose	A few virions
Route of Infection	Smallpox is spread person-to-person through: <ul style="list-style-type: none"> • Close contact (i.e., within ~6 feet) via respiratory droplets or direct contact with lesions • Indirect contact with contaminated material such as clothing or bedding – less common • Airborne transmission via fine-particle aerosol (droplet nuclei) – thought to be rare
Communicability	Contagious from onset of earliest lesion (including oral enanthem) until separation of scabs, with the most infectious period being the 1 st week of rash as oropharyngeal lesions release virus into saliva. For surveillance, investigation, and containment purposes, consider potentially infectious from onset of fever. Secondary attack rate = 38-88% among susceptible household contacts.
Case Fatality	Historically, case-fatality rate has averaged 20-30% (but highly dependent on vaccination status). There are more severe, though less common, forms of smallpox with >95% case-fatality rate: <ul style="list-style-type: none"> • Flat-type (5-7% of cases) – severe toxemia; flat, velvety, confluent lesions • Hemorrhagic-type (3-5% of cases) – severe toxemia; hemorrhagic rash
Incubation Period	Usually 12-14 days (range 7 to 17 days)
Signs & Symptoms (<i>variola major, ordinary type</i>)	Stage 1 (prodrome/preeruptive stage): Acute onset of fever, malaise, rigors, vomiting, headache, & backache lasting 2-4 days; 15% have delirium. All smallpox patients have a febrile prodrome. Stage 2 (eruptive stage): Maculopapular rash (1-4 days after prodrome) on oral mucosa, face & forearms, spreading to trunk & legs→deeply-embedded firm/hard, round papules (day 2 of rash) →vesicles (day 3-4 of rash) →pustules (day 5-12 of rash) →crusty scab (day 13-18 of rash)
Differential Diagnosis (<i>eruptive stage</i>)	Chickenpox, monkeypox, generalized vaccinia, disseminated herpes zoster, disseminated herpes simplex, erythema multiforme, contact dermatitis, enteroviral infection, molluscum contagiosum, secondary syphilis, atypical measles. Use CDC algorithm to determine likelihood of smallpox.
Differentiating Smallpox from Chickenpox	<ul style="list-style-type: none"> • Febrile prodrome precedes smallpox lesions. Chickenpox has mild, if any, prodrome (<24 hr). • Smallpox lesions present at same stage of development within any one anatomical region. Chickenpox lesions appear in different stages. • Smallpox lesions tend to be concentrated on face & distal extremities (centrifugal distribution). Chickenpox lesions tend to be more concentrated on trunk (centripetal distribution). • Smallpox lesions typically occur on palms & soles. Chickenpox: palms & soles spared. • Smallpox lesions are deeply embedded in dermis. Chickenpox lesions are superficial. • Smallpox lesions evolve from macules to papules to pustules over several days (1-2 days/stage). Chickenpox lesions evolve rapidly (< 24 hours) from macules→papules→vesicles→crusts.
Presumptive Diagnosis	Classic rash preceded by febrile prodrome (90% of cases are clinically characteristic)
Laboratory Tests/Sample Collection	Do not attempt specimen collection without prior vaccination and proper personal protective equipment. For consult, page the state lab (DCLS), available 24/7, at 804-418-9923 for assistance and instructions on specimen collection, handling, storage and immediate shipment.
Treatment	<ul style="list-style-type: none"> • Supportive care • Antibiotics for secondary skin infections • Cidofovir (an antiviral med) has shown promising results in laboratory studies – consult health dept.
Infection Control	<ul style="list-style-type: none"> • Consult with health department and hospital infection control ASAP • Isolate cases & follow strict <u>standard, airborne, and contact precautions</u>: <ul style="list-style-type: none"> ▪ Proper hand washing ▪ Gowns, gloves, eye shields, correctly-fitted N-95 masks, & shoe covers ▪ Closed door, negative-pressure room w/ 6-12 air changes/hr & HEPA filtration of exhaust air • Vaccinate workers providing direct patient care and/or handling infected materials • Establish an isolated unit of hospital to minimize exposures, if possible • Double bag, seal & autoclave medical waste, contaminated clothing/bedding/materials • Virus inactivated by solution of 1 part household bleach to 9 parts water (0.5% sodium hypochlorite)
Public Health	Suspected cases of smallpox must be reported to the local public health department by the most rapid means available.